Chapter 3
Command and Control (C2)

3-1.   General

This chapter describes the principles of ADA C2. It outlines the necessary processes, procedures, and capabilities required by counter-air forces to properly detect, acquire, identify, and kill potential counter-air threats; these processes form the core requirement for signal support.

3-2.   Nature

a.   The nature of ADA C2 supports the force commander's operation and decision making processes. It supports the processes to control and plan current and future operations. The ADA C2 system requires the ability to achieve maximum ADA predictive planning, to anticipate the intent of the threat act to disrupt the threat's plans, and to allow the commander to take advantage of opportunities.

b.   ADA commanders can expect to fight the air battle over the full depth of the battlefield from the theater rear boundary to forward of the FLOT. The ADA C2 system must be flexible and must function in near real time over the full depth of the battlefield. Leaders must think quickly. The staff must be highly trained to execute the "sense-think-decide-act" cycle of C2 more quickly than the threat and to operate inside of the reaction time capability.

3-3.   Principles

Three principles are fundamental to the C2 of ADA operations. These are centralized management with maximum decentralized authority to engage, air battle management, and management by exception.

a.   Centralized management by a single air defense commander exercising overall control of the planning and conduct of counter-air operations ensures the coordination, integration, maximum effectiveness, and economy of total ADA assets. However, centralized management, with maximum decentralized authority to engage, ensures rapid and flexible response to the air threat.

b.   The air battle management principle states the need for close coordination among diverse elements of ADA assets, and the need to integrate ADA operations with all other tactical operations, offensive and defensive.

c.   Under the principle of management by exception, subordinate echelons are given maximum freedom of action; higher echelons monitor and intervene on a case-by-case basis where necessary to countermand or modify actions of subordinates.

3-4. ADA C2 Versus Ground C2

a.   Under the umbrella concept of AirLand battle, C2 has different meanings for the air battle versus the land battle. Distances in the air battle are measured in minutes, even seconds. Distances in the land battle are measured in hours. The area of interest in the air battle considers a volume of airspace, with speed of the target critical, versus the two dimensions of primary interest on land. The airspace is occupied by army forces and by joint and allied air forces and encounters a wider range of ECM threats.

b.   The air battle commander's area of interest may cross over land boundaries and may include much larger ranges than the land battle. As such, the air battle dictates farther reaching, greater ECM capable, information gathering systems, and rapid, modular, jam resistant, data distribution and voice communications systems. Due to the nature of air battle, the ADA C2 requires high-speed data distribution links, the capability to rapidly identify targets as friend or threat, and procedural rules that allow maximum decentralization of engagement authority.

3-5.   Functions

The three primary functions of ADA C2 are force C2, operational C2, and targeting C2.

a.   Force C2 includes those activities common to the command control of all ground forces. Some force C2 functions are--

- To analyze the area of operations.

- To provide administration and logistics support.

- To perform tactical operations.

- To provide operational communications.

- To perform ground self-defense.

- To support and sustain the force.

b.   Operational C2 involves ADA airspace management combat operations and activities performed before and during the air battle. Operational C2 includes--

- Commanding and controlling Army airspace (A2C2).

- Observing/enforcing rules of engagement.

- Assigning and allocating ADA resources.

- Establishing system employment procedures and firing doctrine.

- Managing the joint and combined air battles.

c. Targeting C2 encompasses activities of ongoing or imminent air activity that are significant only in the presence of threat aerial targets. Information and data flow are required on a real-time basis. Some targeting C2 activities are--

- Detecting.

- Identifying.

- Assigning targets for engagement.

- Ordering engagement of hostile targets.

- Sending and executing fire control orders.

- Assessing results of engagements.

3-6. Operational Concept

a. ADA, in all types of fights, performs in an environment characterized by rapid movement, heavy electronic warfare, and intense, violent combat conditions. The C2 system must be reliable, swift, and survivable to effectively detect, acquire, identify, and kill threat targets. Sufficient planning prior to counter-air operations is required to establish priorities and procedures under which ADA assets may engage the right targets at the right time and place. Once these plans have been synchronized for the ground and air battle, the C2 system provides the ADA weapons platforms the appropriate information to kill the threat target. Counter-air forces include the spectrum of ADA weapons, other combined arms weapons used in a ground to air defense role, and joint service weapon systems. Specifically, the C2 system--

(1) Links the ADA forces through the ADA SIGOP battalion installed communications network. It also links the area telecommunications system to battlefield functional areas to receive timely command, control, intelligence target, and support information.

(2) Sends out near real-time air defense procedural information from the AADC to all counter-air weapon systems, organic, attached, or supporting the force.

(3) Provides rapid, flexible connectivity from higher to lower headquarters and laterally between units to permit exchange of mutually advantageous surveillance, identification, and control data, thus facilitating mass, mix, and integration and exploiting the mobility of ADA forces.

b. C2 is accomplished through communications facilities at all echelons from brigade through theater. The multichannel telecommunications system primarily passes force C2 information supplemented by tactical combat net radios.

c. ADA operational C2 is largely accomplished by procedural management, within the air defense rules and procedures set up by the AADC and to a limited extent, the corps and division commander.

d.   Targeting C2 information is received from intelligence and ADA organic sensors in the theater, corps, and division areas. USAF E3A, USN E2C, and SIS all provide surveillance information. Early warning of airborne attack may be provided from a combination of HIMAD C2 systems and joint sensor arrays. This long-range early warning must be passed to the entire force over the early warning radio net. Engagement decisions are normally made at the individual ADA fire unit level based upon force C2, operational C2, and targeting C2 information made available through the various systems.

3-7.   EAC ADA Brigade C2

a.   The EAC brigade commander exercises full command of assigned forces because all ADA functions (to include targeting, force, and counter-air operations C2) are passed through his command level. The commander task-organizes and deploys forces to support the priorities of the commander exercising OPCOM/OPCON.

b.   The EAC brigade commander's C2 requirements are--

•   To integrate ADA operations with the theater commander's plan and concept.

•   To maximize effectiveness of organic ADA weapons.

•   To minimize interference between ADA, USAF, USMC, and other airspace users.

•   To maintain an effective interface with the AADC.

•   To coordinate ADA defense matters with adjacent and lower-echelon ADA and other counter-air assets in the theater area.

c.   ADA HIMAD operational and targeting C2 functions are distributed by automatic data links through the AN/TSQ-73 system and Patriot ICC to fire units to achieve fast reaction times. Procedural rules developed at USAF levels are passed through the CRC to the EAC C2 system. The CRC also sends available targeting C2 and identification data through the EAC brigade (AN/TSQ-73) to the battalion C2 system. The EAC brigade C2 system also interfaces with the corps brigade C2 system to facilitate coordination of EAC ADA units located in the corps area.